NEW YORK STATE Integrated Pest Management PROGRAM

Cornell University Cooperative Extension

Elements of IPM for Christmas Tree Production in New York State

This set of basic elements, of Integrated Pest Management (IPM) may assist growers and in implementing an IPM approach for Christmas trees grown in New York. Not all growers will use all elements as managing pests is an individual and dynamic process influenced by field size, trees grown, weather and new knowledge.

The Elements for Christmas Tree IPM in New York State are designed as a self-evaluation tool for growers already implementing IPM or as an educational tool for growers new to the concepts of IPM. If you have comments, questions or suggestions please contact Brian Eshenaur bce1@cornell.edu or Elizabeth Lamb eml38@cornell.edu.

MAJOR PESTS OF CHRISTMAS TREE SPECIES

MAJOR PESTS OF FIR	
Insects	**Diseases**
Balsam Twig Aphid	Phytophthora root rot
Balsam Woolly Adelgid	Fir - Fern Rust
Elongate Hemlock Scale	Current Season Needle Necrosis
Spruce Spider Mite	
White Grubs	
White Pine Weevil	

MAJOR PESTS OF DOUGLAS FIR	
Insects	**Diseases**
Cooley Spruce Gall Adelgid	Swiss Needle Cast
Cryptomeria scale	Rhabdocline Needle Cast
White Grubs	Diplodia Tip Blight
White Pine Weevil	
Pine Shoot Borer	

MAJOR PESTS OF SPRUCE	
Insects	**Diseases**
Cooley Spruce Gall Adelgid	Rhizosphaera needle cast
Eastern Spruce Gall Adelgid	
Spruce Spider Mites	
White Pine Weevil	
Elongate Hemlock Scale	

MAJOR WEEDS OF CHRISTMAS TREES
Weeds
Annuals such as: Pigweed, Foxtail, Ragweed Crabgrass, Horseweed (Marestail), Lamb's Quarter
Biennials such as: Queen Anne's Lace, yellow rocket
Perennials such as: Horsetail, Quackgrass, Johnsongrass, Canada Thistle, Goldenrod, Swallowwort
"Climbing" weeds such as: Poison Ivy, Virginia creeper, Wild Grape, Wild buckwheat, Field Bindweed, Catchweed Bedstraw

ELEMENTS

PRE-PLANT (RE-PLANT) IPM CONSIDERATIONS	
Activity	**Check if done**
Create and/or update field maps with information such as soil type, drainage patterns, problem weeds and Christmas tree species	
Match appropriate Christmas tree species to the site conditions, especially considering soil pH and drainage characteristics	
Plan plantings so blocks of land will be open to rotation and do careful weed management between plantings	
Determine tree spacing to allow good air movement and to allow enough room for equipment	
Inspect plants upon arrival and discard those with signs of disease infection or insect infestation or poor vigor/root system	

PRE-GROWING SEASON IPM CONSIDERATIONS	
Activity	**Check if done**
Maintain an inventory of pesticides	
If the plans for the year include restricted use pesticides, make sure pesticide use license is current and seek re-certification training as needed	
Ensure all personal protective equipment is clean and stored properly	
Inspect and clean pesticide storage and mixing areas	
Calibrate pesticide application equipment annually	

CROP MANAGEMENT	
Activity	**Check if done**
Use soil analysis, to determine appropriate fertilizer programs	
Keep complete records of soil test results and fertilizer applications (rate and timing)	
Record dates of budding, and significant weather events	
Use growing degree days to schedule your pest management	
Test water source(s) used for pesticide mixing for pH and alkalinity	
Adjust tree species grown as pest pressures dictate	

GENERAL PEST MANAGEMENT	
Activity	**Check if done**
Have a plan for pest management based on time of season, pest biology, pest thresholds, and available management options	
Scout regularly for insects, diseases and weeds, using a plan that covers all tree species and planting areas	
When scouting, inspect trees thoroughly, including the interior needles and lower branches.	
Identify all insect, weed and disease problems	
Maintain scouting and pest control records in order to predict pest problems	
To assist in pest scouting, use resources, such as *Branching Out* or regional pest updates	

IN-SEASON INSECT MANAGEMENT	
Activity	**Check if done**
Remove and destroy infested plant parts prior to insect emergence for insects such as white pine weevil and spruce gall adelgids	
Plan to harvest or carefully remove trees and those surrounding if damaged by insects such as balsam wooly adelgid	
Use insecticides only when pest populations reach potential to damage crop	
Choose insecticide products carefully so beneficial insects are not killed when pests are being controlled, and rotate pesticides to reduce the chance of pesticide resistance developing	
Keep accurate spray records for legal requirements, gauging efficacy and year to year comparisons	

IN-SEASON DISEASE MANAGEMENT	
Activity	**Check if done**
Prune and remove trees as needed to maintain adequate spacing for good air circulation	
Remove individual trees severely damaged by diseases such as needlecasts	
If records indicate that a disease is likely to occur, apply fungicides at the appropriate time, rate and frequency based on environmental conditions and the product label	

IN-SEASON WEED MANAGEMENT	
Activity	**Check if done**
Use groundcover management techniques that reduce help control weeds, soil erosion, nutrient runoff and herbicide use	
Manage weeds in vacant fields and land bordering production area to reduce weed, disease, movement into Christmas trees	
Clean equipment before moving to a new location to prevent movement of weed seeds or vegetative portions to new field	
Use mowing and/or effective herbicides at the recommend time of year for dominant or difficult to control weeds	

NUISANCE WILDLIFE MANAGEMENT	
Activity	**Check if done**
Practice good groundcover management at a height low enough to reduce problems with moles, rabbits, and groundhogs	
Use control measures other than pesticide baits for groundhogs, mice, moles, rabbits, and voles	
Follow all wildlife management laws, and get appropriate permits for nuisance deer management	
If deer pressure is high enough, use fencing	

GROWER IPM EDUCATION	
Activity	**Check if done**
Train employees in IPM practices	
Participate in educational events to learn more about pest management	
Learn more about the life cycle of the most important insects, weeds and diseases in your plantings	
Learn to recognize beneficial insects and/or predators/parasitoids that naturally control pests	
Have a current year's copy of Cornell's Pest Management Guide for Commercial Production and Maintenance of Trees and Shrubs	